Federal Fleet Sustainability Requirements

Federal Energy Management Program

Karen Guerra, FEMP

Ted Sears, NREL

January 2017

FEMP
Federal Energy Management Program

FEMP's Sustainable Federal Fleets Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

***Mission:* Assist Federal agencies with meeting or exceeding requirements for reducing fleet GHG emissions**

- Understanding and meeting Federal requirements
    - Guidance
    - Handbook
    - FAST system maintenance, upgrades, and training
- Technical assistance, analysis, and tools
    - Fuel consumption dashboard (FleetDASH)
    - Geographic analysis of fleet fueling patterns, for facilitating development of new alternative fuel infrastructure
- Education and communication
    - Federalfleets.energy.gov
    - INTERFUEL working group

FEMP Federal Fleet Program
Overview

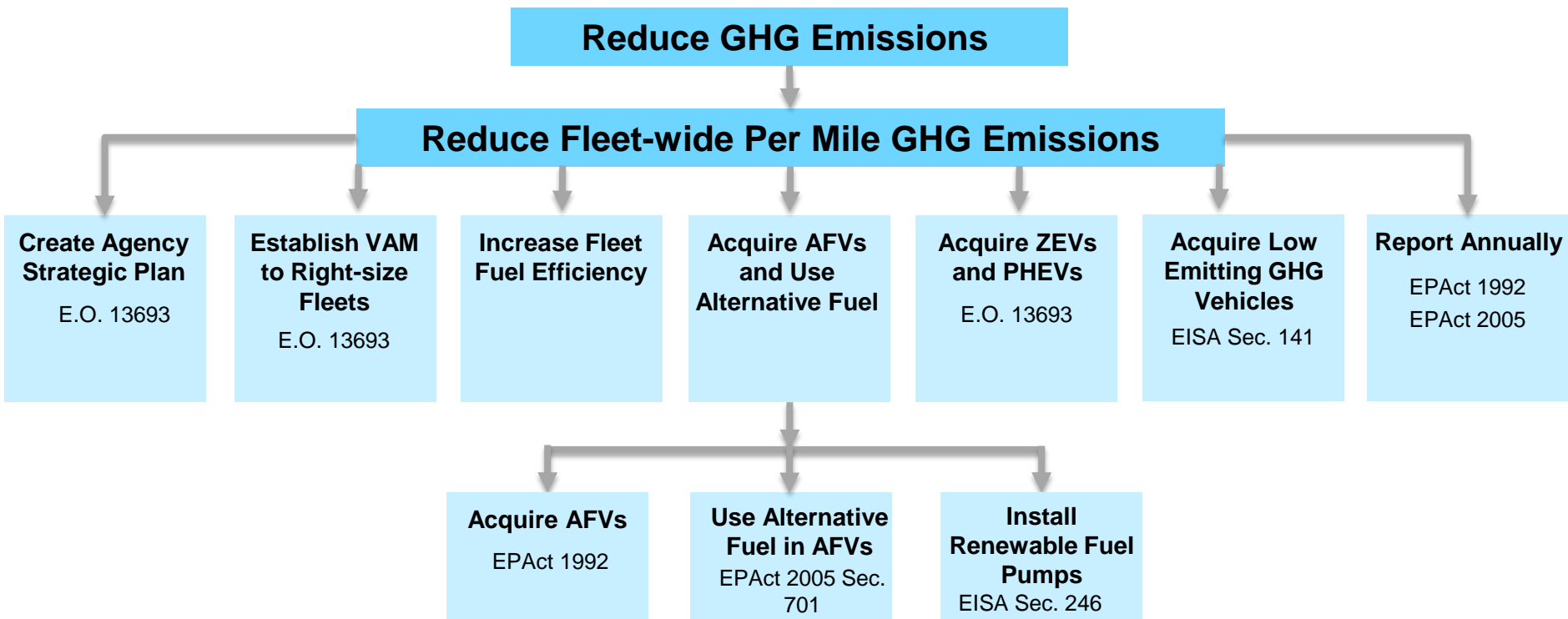|	
FEMP Fleet Guidance	*federalfleets.energy.gov* • **Guidance and Handbook Documents**
FEMP Fleet Training	*federalfleets.energy.gov/information_resources* • **Federal Fleet Management 101 (FEMP First Thursday)** • **Electric Vehicles (FEMP First Thursday)** • **EPAct 2005 Section 701** • **EISA Section 141**
Fleet Tools	*federalfleets.energy.gov/FleetDASH/* • **Fleet Sustainability Dashboard (FleetDASH)** *www.afdc.energy.gov* • **Alternative Fuel Station Locator** • **TransAtlas** • **Petroleum Reduction Planning Tool**
Other resources	*www.fueleconomy.gov* **GHG emissions per mile** **Fuel economy information and tips** *www.epa.gov/greenvehicles* **Vehicle ratings based on GHG emissions/fuel economy**

Federal Fleet Requirements- Overview

The overarching Federal fleet goal is to **increase efficiency** across Federal operations

Federal fleet metric: **fleet-wide per mile GHG emissions**

Reduce GHG Emissions

Reduce Fleet-wide Per Mile GHG Emissions

Create Agency Strategic Plan	**Establish VAM to Right-size Fleets**	**Increase Fleet Fuel Efficiency**	**Acquire AFVs and Use Alternative Fuel**	**Acquire ZEVs and PHEVs**	**Acquire Low Emitting GHG Vehicles**	**Report Annually**
E.O. 13693	E.O. 13693			E.O. 13693	EISA Sec. 141	EPAct 1992 EPAct 2005

Acquire AFVs	**Use Alternative Fuel in AFVs**	**Install Renewable Fuel Pumps**
EPAct 1992	EPAct 2005 Sec. 701	EISA Sec. 246

Overview of Federal Fleet Sustainability Requirements

	Fleet Requirement	Source & Lead Agency	Description
Emissions	**Reduce per Mile GHG emissions**	E.O. 13693 Sec. 3(g)(ii) DOE	• 4% reduction by FY17 • 15% by FY21 • 30% by FY25
	Reduce overall GHG emissions	E.O. 13693 Sec. 2 DOE	Reduce fleet GHG emissions as part of agency-established reduction target for FY 2008 to FY 2025
Vehicle Acquisition	**Optimize inventory, right-size fleet, & deploy telematics**	E.O. 13693 Sec. 3(g)(iv) GSA	Establish a structured VAM to determine the appropriate size and number of motor vehicles; Ensure fleet management systems support collection, management, and reporting using vehicle level data
	Acquisition of ZEVs and PHEVs	E.O. 13693 Sec. 3(g)(v) DOE	• 20% of new passenger vehicle acquisitions by FY20 • 50% of new passenger vehicle acquisitions by FY25
	Acquisition of AFVs	EPAct 1992 DOE	At least 75 percent of LDVs acquired in MSAs/CMSAs must be AFVs
	Acquisition of low GHG-emitting vehicles	EISA § 141 DOE	Prohibits agencies from acquiring vehicles that are not low-GHG-emitting vehicles
AF Use	**Alternative fuel use in AFVs**	EPAct 2005 § 701 DOE	All dual-fueled vehicles must use alternative fuel if reasonably available (i.e., unless waivered)
	Alternative fuel infrastructure	EISA § 246 DOE	Every federal fleet fueling center must install a renewable fuel pump

Why Alternative Fuel Vehicles?

Emission Reductions — *Reduced or even zero emissions counted*

Operating costs — *Lower fuel cost per mile and maintenance costs*
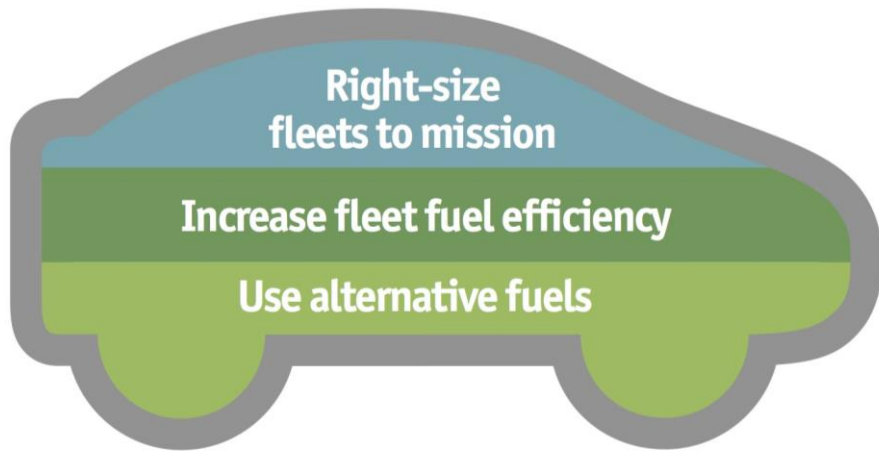
Support market development — *Lead by example in growing the AFV market*

Performance — *Vehicles that meet mission requirements*

The Driving Principles of GHG Emission Reduction

Right-size fleets to mission

Increase fleet fuel efficiency

Use alternative fuels

Right-size fleets to mission
Completing VAM to identify and dispose of inefficient vehicles, and replace them with lower GHG emitting vehicles

Reducing vehicle miles travelled

Replacing existing vehicles with higher fuel economy vehicles
Right-sizing vehicles

Includes HEVs, PHEVs, and LSEVs

Operational changes
Improved maintenance

Driving more efficiently

Avoiding Idling

Maximize displacement of conventional fuels w/ alternative fuels
ZEVs & PHEVs and charging infrastructure

E85, CNG, etc. that require infrastructure and AFVs

B20 that requires infrastructure

Right-sizing the fleet to mission
VAM study

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

Generate a fleet profile → **Develop minimum utilization criteria** → **Compare existing fleet to actual mission requirements** → **Develop acquisition plan** → **Review and Update VAM**

Utilization study, vehicle inventory and **mission requirements**

Validate vehicle need based on mission needs, define baseline of required fleet

Dispose or reassign vehicles as needed

Evaluate alternatives where possible

Create a multi-year acquisition plan, recommend vehicle type and size by location, and place AFVs where fuel is available
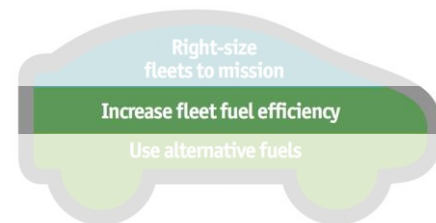
Update VAM at least every five years

Increase Fleet Fuel Efficiency

- **Acquire higher fuel economy vehicles**
  - Downsize vehicles
  - Use VAM to determine the optimal types based on mission need

Right-size fleets to mission
Increase fleet fuel efficiency
Use alternative fuels

- **Acquire hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs)**
  - Can reduce petroleum and GHG emissions by 30% or more
  - Focus deployment of HEVs in areas lacking access to alternative fuel

- **Maintain vehicles to improve fuel economy**
  - Perform regularly scheduled and preventative maintenance

- **Drive more efficiently**
  - Use cruise control, avoid fast starts, remove excess weight, etc.

- **Avoid excessive idling**
  - Turn off engines when vehicles are stopped or parked
  - Use idling reduction technologies for essential heating, cooling, and other auxiliary loads (e.g., APUs)

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

**Alternative fuels include but are not limited to:**

– E85

– Compressed natural gas (CNG)

– Liquefied natural gas (LNG)

– Liquefied petroleum gas or propane (LPG)

– Neat (100%) biodiesel (B100) or biodiesel blends

– Electricity

– Hydrogen

Dual-fueled AFVs __MUST__ use alternative fuel if available (*EPAct 2005, Section 701*):

– E85 FFVs,

– Bi-fuel CNG or LNG vehicles, and

– Bi-fuel LPG vehicles.
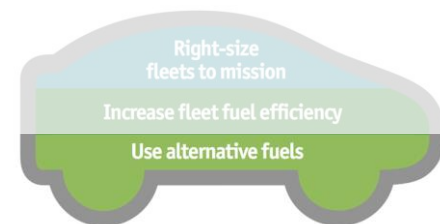
Per Mile GHG Emission Reduction Targets
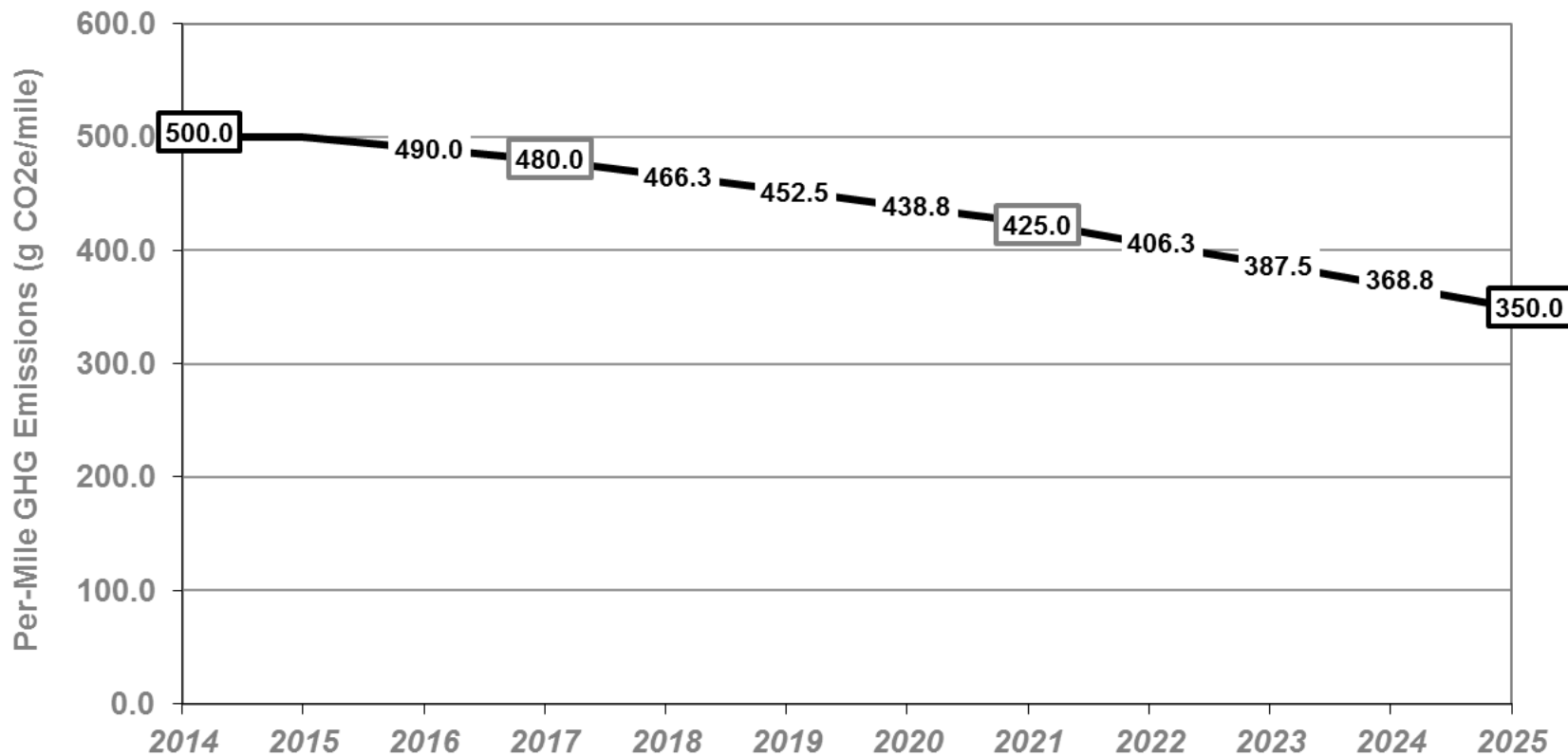
Alternative Fuels – efficiency measured as *emission reductions*

Right-size fleets to mission
Increase fleet fuel efficiency
Use alternative fuels

(16%) LPG
(20%) B20
(25-28%) CNG
(25-28%) LNG
(33%) HEV
(85%) E85
(86%) PHEV
100% Reduction B100

y-axis: kg CO2e/GGE (0 to 10)

x-axis: Diesel, Gas, LPG, B20, CNG, LNG, HEV, E85, PHEV, B100, BEV, Hydrogen

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy
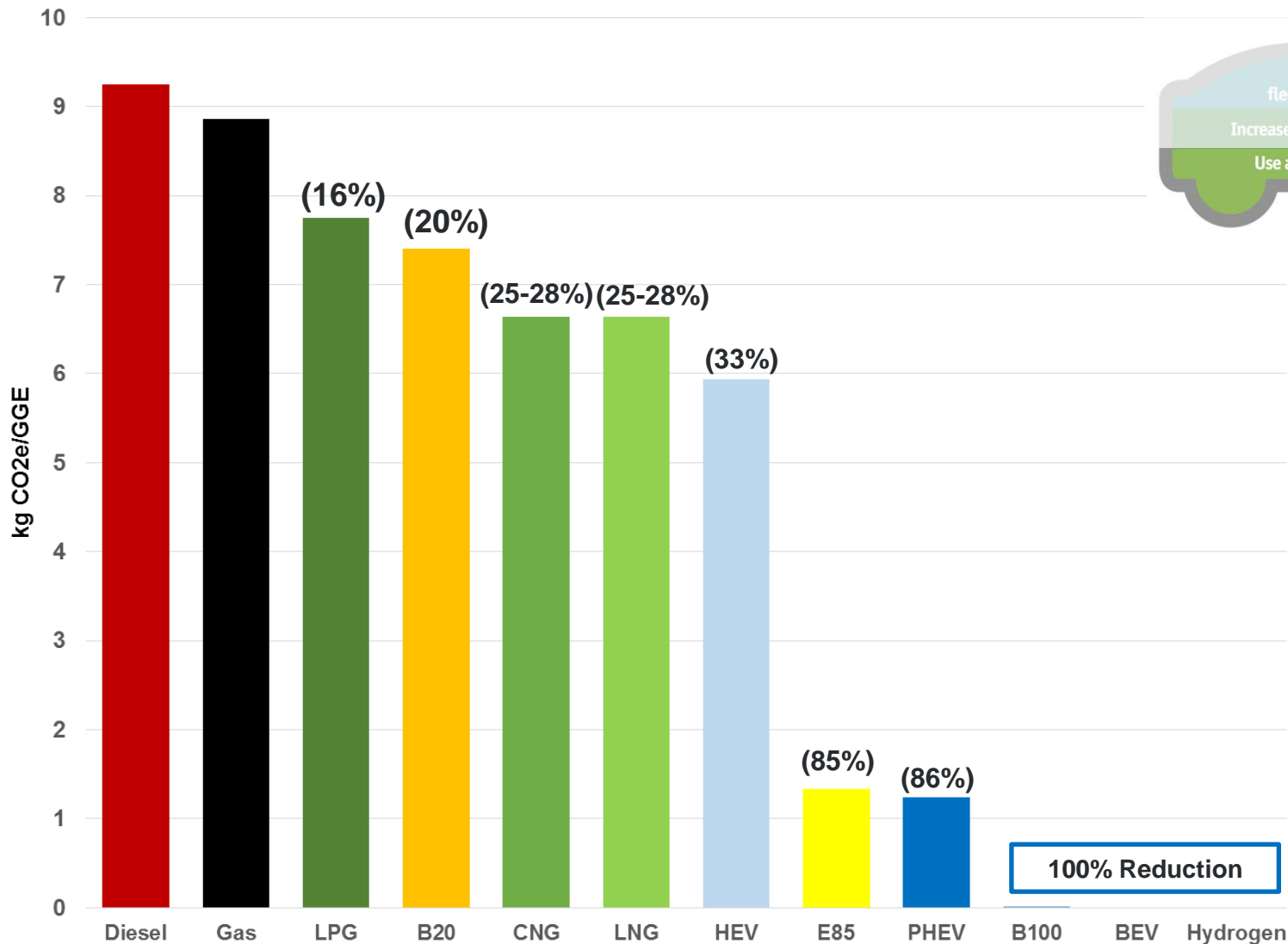
Balance vehicle acquisition to support strategies with Federal fleet requirements

GHG Emission Reduction Strategy	Vehicle Acquisition Strategy	Regulatory Constraints
Right-size fleets to mission	***Dispose or reduce acquisitions*** to ensure fleet is right-sized to mission	***VAM*** (EO 13693)
Increase fleet fuel efficiency	***Acquire HEVs, PHEVs, and higher fuel economy vehicles*** to ensure vehicles are right-sized	***Low GHG-emitting vehicles*** (EISA §141)
Use alternative fuels	***Acquire EVs, AFVs, or diesel vehicles*** to support AF, biodiesel, or EV strategies	***AFV acquisitions*** (EPAct 92) ***ZEVs & PHEVs*** (EO 13693)

Requirement: Acquire AFVs

- **EPAct 1992:** Ensure that 75% of light duty vehicle acquisitions in metropolitan statistical areas (MSAs) are AFVs. (AFVs acquired outside of MSAs and biodiesel use counts towards meeting requirements)

- **E.O. 13693**: ZEVs and PHEVs account for 20% of new passenger vehicle acquisitions by end of FY2020; 50% by end of FY2025

- **EISA 2007, Section 141**: LDVs and passenger MDVs must be low GHG emitting vehicles (exceptions permitted). Low GHG emitting vehicles meet AFV definition in locations without access to alternative fuel
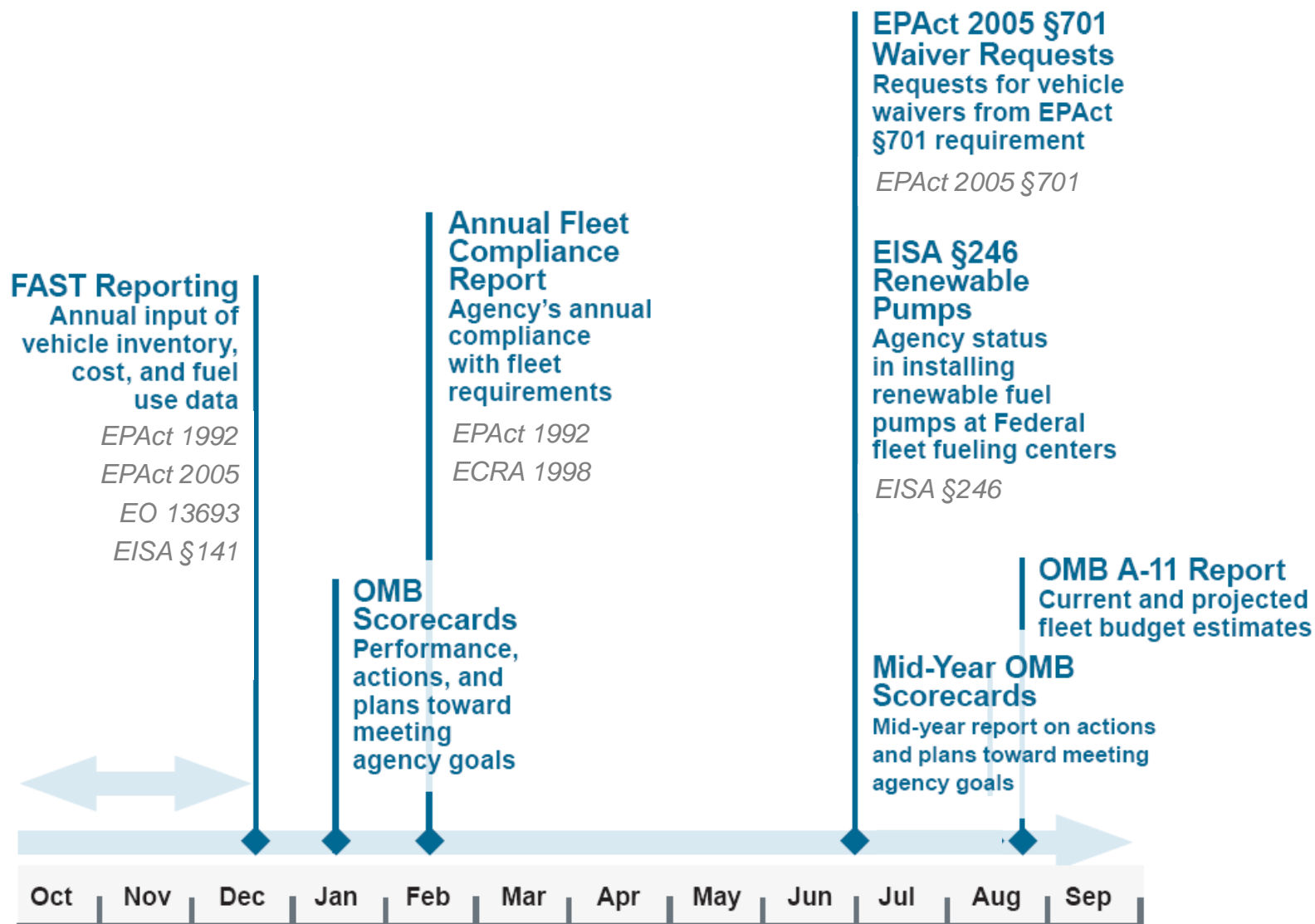
Agencies should:

- Acquire AFVs in areas where alternative fuel is/will become available

- Focus HEV, PHEV, and BEV acquisitions in areas where alternative fuel is not available

- Consider LSEVs, low GHG emitting vehicles (in locations without access to alternative fuel) and other high efficiency vehicles

EPAct 2005 §701 Waiver Requests
Requests for vehicle waivers from EPAct §701 requirement

EPAct 2005 §701

EISA §246 Renewable Pumps
Agency status in installing renewable fuel pumps at Federal fleet fueling centers

EISA §246

Annual Fleet Compliance Report
Agency's annual compliance with fleet requirements

EPAct 1992
ECRA 1998

FAST Reporting
Annual input of vehicle inventory, cost, and fuel use data

EPAct 1992
EPAct 2005
EO 13693
EISA §141

OMB A-11 Report
Current and projected fleet budget estimates

OMB Scorecards
Performance, actions, and plans toward meeting agency goals

Mid-Year OMB Scorecards
Mid-year report on actions and plans toward meeting agency goals

Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep

- Helps agencies develop an overall fleet-wide per mile GHG emission reduction strategy and electric vehicle acquisition strategy.

- **Audience**: *Agency Chief Sustainability Officers* and *headquarters-level fleet managers*

- Focuses on planning stage of framework

  – Federal fleet requirements and applicability

  – Agency-wide fleet management plan and Green House Gas (GHG) emissions reduction plan

  – Per-mile GHG emission reduction strategies to meet and exceed requirements

  – Guidance to meet Zero Emission Vehicle (ZEV) and Plug-in Hybrid Electric Vehicles (PHEV) acquisition requirements and deployment of related charging infrastructure

  – Guidance to support Vehicle Allocation Methodology (VAM)

  – Guidance for telematics and vehicle asset-level data management

Guidance will assist agencies in reducing fleet-wide per mile GHG emissions while meeting mission-critical needs and complying with all Federal mandates

E.O. 13693 Fleet Guidance Framework

Fleet guidance is organized around a cyclical fleet management framework—**plan, collect, strategize, and implement**
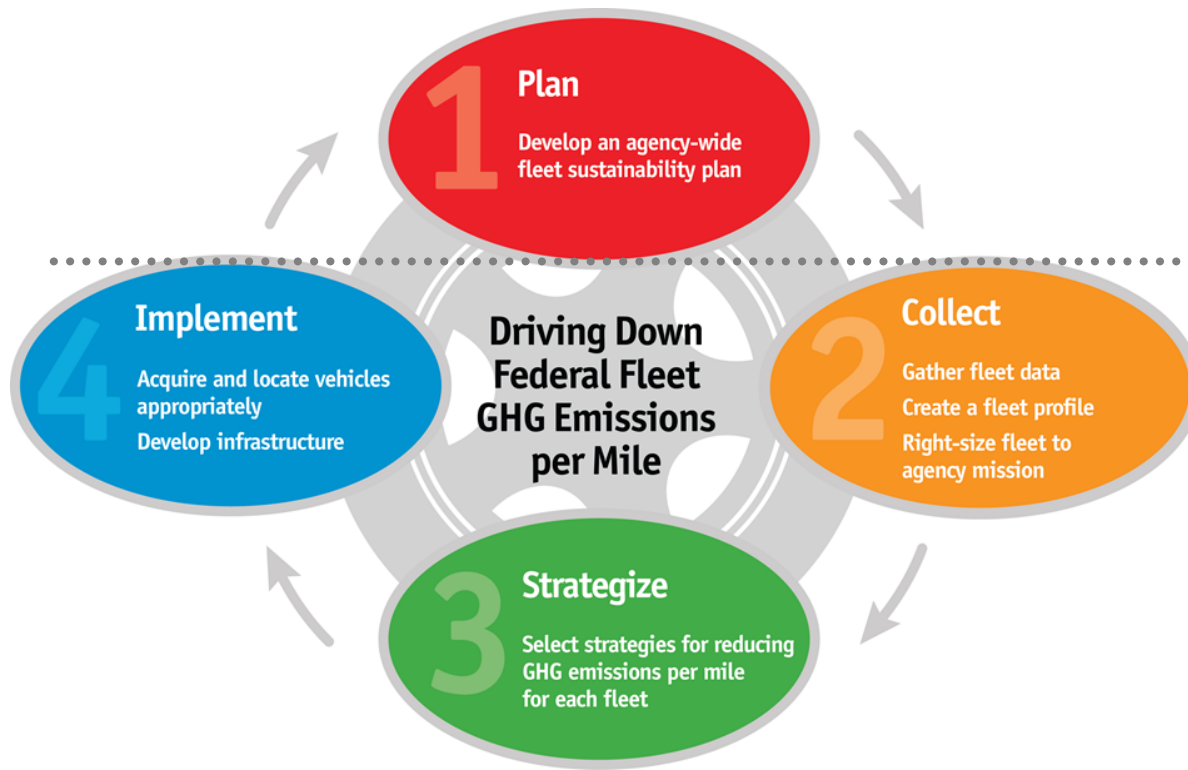
EO Guidance
- Focused on EO requirements
- High Level Planning
- Updated infrequently

Comprehensive Federal Fleet Management Handbook
- Address all fleet requirements and steps to implementation
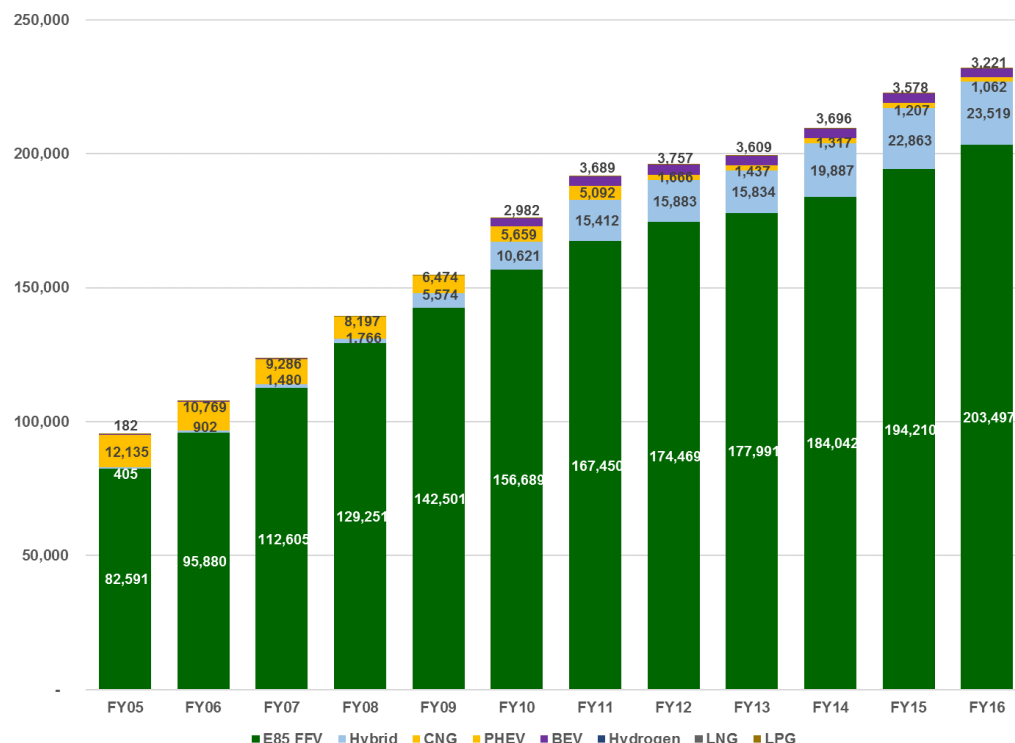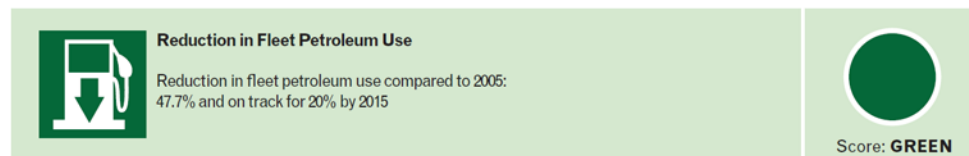- 100+ pages
- Can be updated regularly

Review and analyze agency compliance data

OMB Scorecards

Data Collection and Analysis:

- Per-Mile GHG Emissions

- Vehicle AFV Acquisitions

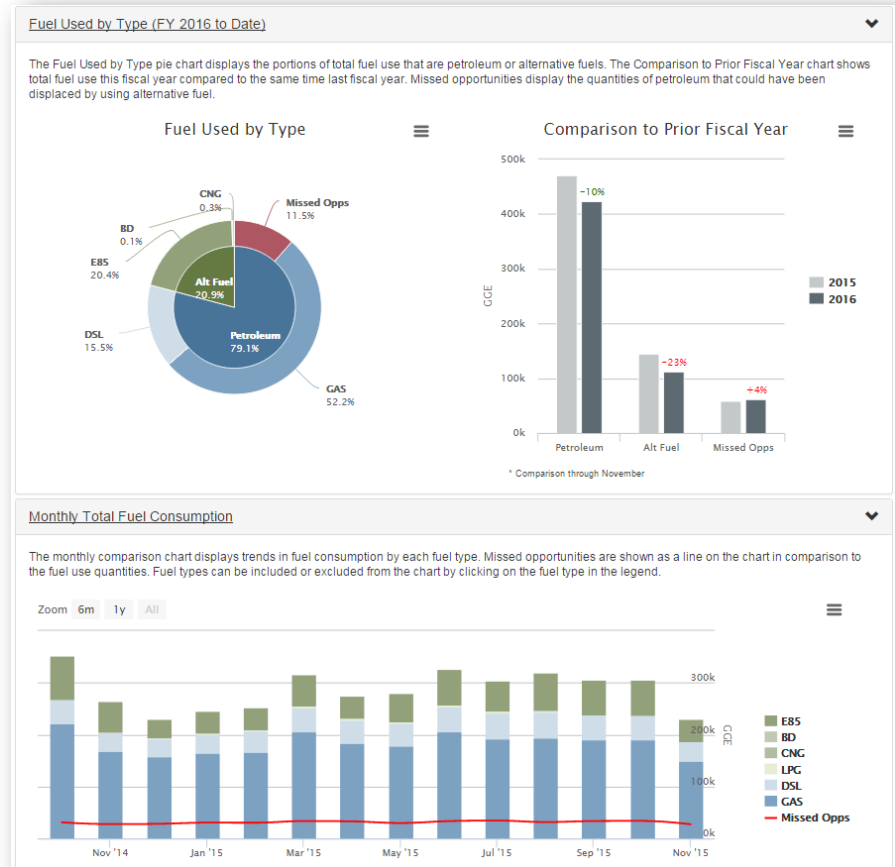- Alternative fuel consumption

- Section 701 Waivers

- GIS Analysis

Reduction in Fleet Petroleum Use
Reduction in fleet petroleum use compared to 2005:
47.7% and on track for 20% by 2015

Score: **GREEN**

	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16
BEV							3,689	3,757	3,609	3,696	3,578	3,221
PHEV						2,982				1,317	1,207	1,062
CNG	182	10,769	9,286	8,197	6,474	5,659	5,092	1,666	1,437	19,887	22,863	23,519
Hybrid	12,135	902	1,480	1,766	5,574	5,659	15,412	15,883	15,834	184,042	194,210	
	405					10,621						
E85 FFV	82,591	95,880	112,605	129,251	142,501	156,689	167,450	174,469	177,991	184,042	194,210	203,497

Legend: ■ E85 FFV ■ Hybrid ■ CNG ■ PHEV ■ BEV ■ Hydrogen ■ LNG ■ LPG

FEMP Federal Fleet Program
FleetDASH

FleetDASH is a fleet sustainability management tool.

Federal fleets' fuel consumption is tracked through credit card transactions.

Successes and "missed opportunities" to use alternative fuel are highlighted

Monthly data updates provide actionable information to fleet managers.

Organizational drilldown capabilities increase transparency and accountability.

AFDC Station Locator

Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. Enter a state to see a station count.

Find Stations | Plan a Route

Q address, ZIP, or state... | **Go**

Electric

more search options

11,944 electric stations
30,191 charging outlets
in the United States

Excluding private stations

Location details are subject to change. We recommend calling the stations to verify location, hours of operation, and access.

ABOUT THE DATA

Go to mobile version
Download iPhone app

www.afdc.energy.gov

Download Data   Developer APIs
Data last updated: 01/18/2016

AFDC Web Tools

Calculators

Vehicle Cost Calculator

Compare cost of ownership and emissions for most vehicle models. 📱 mobile

Petroleum Reduction Planning Tool

Create a plan for your fleet to reduce petroleum consumption and emissions.

CNG VICE Model 2.0

Evaluate ROI and payback period for natural gas vehicles and infrastructure.

AFLEET Tool

Calculate a fleet's petroleum use, cost of ownership, and air pollutant and GHG emissions.

www.afdc.energy.gov

Vehicle Cost Calculator

Choose vehicles to compare

Select up to eight vehicles to compare from the makes and models below

| 2016 ▾ | Ford ▾ |

Vehicle	Annual Fuel Use	Annual Electricity Use	Annual Fuel/Elec Cost	Annual Operating Cost	Cost Per Mile	Annual Emissions (lbs CO2)
2016 Ford Focus Electric EV	0 gal	3,896 kWh	$505	$2,610	$0.22	4,675
2016 Ford Focus FWD Gasoline	362 gal	0 kWh	$1,267	$3,524	$0.30	8,687

Petroleum Reduction and Planning Tool

SET GOAL	CLEAR PLAN		Petroleum Reduction gal/yr	GHG Reduction tons CO₂/yr	Fuel Cost Savings $/yr	Impact on Plan percent
Savings Methods						
Replace Vehicles	ADD TO PLAN		0	0	$0	0%
Use Alternative Fuel in Existing Vehicles	ADD TO PLAN		0	0	$0	0%
Reduce Idling	ADD TO PLAN		0	0	$0	0%
Reduce Mileage	ADD TO PLAN		0	0	$0	0%
Drive Efficiently	ADD TO PLAN		0	0	$0	0%
Total savings from plan per year			0 gallons	0 tons of CO₂	$0	100%

Overview: FEMP Federal Fleet Program *Resources*

FEMP Fleet Guidance	*federalfleets.energy.gov* • **Guidance and Handbook Documents**
FEMP Fleet Training	*federalfleets.energy.gov/information_resources* • **Federal Fleet Management 101 (FEMP First Thursday)** • **Electric Vehicles (FEMP First Thursday)** • **EPAct 2005 Section 701** • **EISA Section 141**
Fleet Tools	*federalfleets.energy.gov/FleetDASH/* • **Fleet Sustainability Dashboard (FleetDASH)** *www.afdc.energy.gov* • **Alternative Fuel Station Locator** • **TransAtlas** • **Petroleum Reduction Planning Tool**
Other Resources	*www.fueleconomy.gov* **Emissions per mile** **Fuel economy information and tips** *www.epa.gov/greenvehicles* **Vehicle ratings based on emissions/fuel economy**

Clean Cities Framework

Local & National Partnerships

Information & Education

Competitively Awarded Financial Assistance

Technical & Problem Solving Assistance

Clean Cities Activities

Clean Cities coalitions are locally based with the ability to tap national resources.

- National network of nearly **100 local coalitions**

- **82% of the total U.S. population** lives inside coalition boundaries

- Nearly **500,000 alternative fuel vehicles (AFVs)**

Clean Cities Coalitions

Clean Cities
U.S. Department of Energy

* Connecticut Clean Cities Include:
– Norwich
– New Haven
– Connecticut Southwestern Area
– Capitol Clean Cities (Hartford area)

Map Date: 04/12/16

FEMP Federal Fleet Program
Contacts

Karen Guerra (Program Manager)
Federal Energy Management Program
202-586-4272
Karen.guerra@ee.doe.gov

Daniel Gore
Federal Energy Management Program
202-586-6477
Daniel.Gore@ee.doe.gov

Cabell Hodge
National Renewable Energy Laboratory
202-488-XXXX
Cabell.hodge@nrel.gov

Ted Sears
National Renewable Energy Laboratory
202-488-2221
ted.sears@nrel.gov

Julian Bentley
Bentley Energy Consulting
703-585-6977
julian@bentleyenergy.com